

WE CLAIM:

1. A leadframe for use in the assembly of integrated circuit chips, comprising:
 - 5 a base metal structure having an adherent layer comprising nickel covering said base metal;
 - an adherent layer of tin solder on said nickel layer, selectively covering areas of said leadframe suitable for parts attachment; and
 - 10 an adherent layer comprising palladium or silver on said nickel layer, selectively covering areas of said leadframe suitable for bonding wire attachment.
2. The leadframe according to Claim 1 wherein said base metal is copper, copper alloy, aluminum, iron-nickel alloy, or invar.
- 15 3. The leadframe according to Claim 2 wherein said base metal has a thickness between about 100 and 300 μm .
4. The leadframe according to Claim 1 wherein said nickel layer has a thickness in the range from about 0.2 to 20 3.0 μm .
5. The leadframe according to Claim 1 wherein said solder layer comprises pure tin in a matte, coarse grain, low carbon content, and annealed composition.
- 25 6. The leadframe according to Claim 5 wherein said tin solder has a reflow temperature of 232 °C, compatible with wire bonding and molding temperatures of no more than 215 °C.
7. The leadframe according to Claim 5 wherein said solder 30 layer has a thickness in the range from about 4.0 to 6.0 μm .

8. The leadframe according to Claim 1 wherein said palladium or silver layer has a thickness in the range from about 20 to 60 nm.
9. The leadframe according to Claim 8 wherein said palladium layer covers selective areas having boundaries of loose tolerance.
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10. A leadframe for use with integrated circuit chips comprising:
 - a base metal structure having a plated layer of nickel fully covering said base metal;
 - a plated layer of pure tin on said nickel layer, selectively covering areas of said leadframe suitable for parts attachment; and
 - a plated layer of palladium or silver on said nickel
15 layer, selectively covering areas of said leadframe suitable for bonding wire attachment.
11. A semiconductor device comprising:
 - a leadframe comprising a chip mount pad for an integrated circuit chip and a plurality of lead segments, each having a first end near said mount pad and a second end remote from said mount pad;
20 said leadframe having a surface layer of nickel;
said leadframe further having a layer of palladium on said nickel layer, selectively covering said first ends of said lead segments in a thickness suitable for bonding wire attachment;
25 an integrated circuit chip attached to said mount pad;
bonding wires interconnecting said chip and said first ends of said lead segments;
30 encapsulation material surrounding said chip, bonding wires and said first ends of said lead

segments, while leaving said second ends of said lead segments exposed; and

a layer of pure tin solder on said nickel layer,
selectively covering said second ends of said
lead segments in a thickness suitable for parts
attachment.

5 12. The device according to Claim 11 wherein said bonding wires are selected from a group consisting of gold, copper, aluminum and alloys thereof.

10 13. The device according to Claim 11 wherein the bonding wire contacts to said first ends of said lead segments comprise welds made by ball bonds, stitch bonds or wedge bonds.

15 14. The device according to Claim 11 wherein said encapsulation material is selected from a group consisting of epoxy-based molding compounds suitable for adhesion to said leadframe.

20 15. The device according to Claim 11 further comprising lead segments having said second ends bent, whereby said segments obtain a form suitable for solder attachment.

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